## ABSTRACT

**EFFECT OF ANTIOXIDANTS LIKE α-TOCOPHEROL AND ASCORBIC ACID IN REDUCING THE PROGRESSION OF VASCULAR DEMENTIA AND ASCERTAIN THE MORPHOLOGICAL CHANGES IN THE RED BLOOD CELLS AS OXIDATIVE STRESS MARKER- A RANDOMIZED, OPEN LABEL, COMPARATIVE PILOT STUDY.**

Dr. B. Vasanthi , Dr. S. Gomathi.

### INTRODUCTION:

Dementia is characterised by progressive cognitive impairment in the presence of clear consciousness. **Vascular dementia** is the second most common type of dementia. Vascular dementia follows either a clinical stroke or a subclinical vascular brain injury in patients with risk factors like **Diabetes mellitus** and **Systemic Hypertension**. **Oxidative stress** is increased generation of free radicals in the body. It plays a significant role in the pathogenesis of not only vascular dementia but also its risk factors, hypertension and diabetes mellitus. Red blood cells (RBC) are the first in the body to get exposed to oxidative stress and the free radical injury to RBCs causes haemolytic anemia in diabetic patients. These structurally damaged RBCs serve as marker of oxidative stress**. Vitamin C** and **Vitamin E** serve as antioxidants due to their ability to scavenge free radicals. They correct the haemolytic anemia and also prevent oxidative stress induced cerebral ischemia. Supplementation of vitamin C and Vitamin E in patients of vascular dementia therefore prevents the further progression of the disease.

### METHODS:

In this study, 60 patients of Mild Vascular Neurocognitive Impairment (VNCI) satisfying the Diagnostic and Statistical manual of mental disorder(DSM-5) criteria for mild VNCI, with Hypertension and Type 2 Diabetes mellitus as the vascular risk factors and in the age group of 60 to 70 years were included. They were randomised into control group of 30 patients who received the standard treatment for cerebrovascular disease (anti-diabetic, anti-hypertensive with/without antiplatelet drug therapy) and the study group of 30 patients who received the vitamin C 500mg once daily and vitamin E 400mg once daily along with the standard treatment, for a period of 12 weeks and followed up for one month after stopping the study drugs. The **RBC morphology** of the patients in both groups were studied under high power microscope and percentage of dysmorphic RBCs were noted. The **cognition status** of the patients in both groups were assessed by a 30 point questionnaire based on Mini Mental Status Examination (in regional language) at the beginning of study and at the end of every month till 16 weeks. Other parameters like Blood pressure, fasting and

postprandial blood glucose levels, Haemoglobin, RBC counts, Lipid profile, Liver function test, Renal function test were also assessed during the study.

**RESULTS:**

There was a significant reduction in the percentage of **dysmorphic RBCs** in the study group (from **73% to 7.23%, p value= <0.05**) at the end of 12weeks in comparison to the control group. The mean haemoglobin improved from **10.53 g/dl to 12.43 g/dl** in the study group (p=<0.05) at the end of 12 weeks. The mean fasting blood glucose decreased from **148.03 mg/dl to 118.87 mg/dl** (p=<0.05) in the study group at the end of 12 weeks of treatment. There was a greater reduction in the blood glucose levels in the study group compared to the control group. The cognition assessment scores improved in the study group at the end of 12 weeks , from a mean score of **20 to 22.43** which was statistically significant (p=<0.05). In the control group the score decreased from a mean of 19.80 to 19.73 at the end of 12 weeks of treatment. The systolic and diastolic blood pressures also reduced significantly in the study group at the end of 12 weeks of treatment , as compared to the control group. There was significant reduction in haemolytic anemia at the end of 12 weeks of treatment with vitamin C(Ascorbic acid) and Vitamin E(α Tocopherol). The **cognition status** showed a significant improvement in the study group at the end of 12 weeks. All these beneficial effects were sustained during the four weeks follow up period. Antioxidants,vitamin C and vitamin E supplementation thus improves the memory and cognition, reducing the progression of vascular dementia.

**KEY WORDS:** Vascular dementia, Oxidative stress, Antioxidants, Ascorbic acid, α-Tocopherol, Cognition, Diabetes mellitus, Systemic hypertension, vascular neurocognitive impairment, cerebral ischemia.